



Spectral Gamma-Ray Borehole
Log Data Report

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Borehole

30-03-09

Log Event A

Borehole Information

Farm : <u>C</u>	Tank : <u>C-103</u>	Site Number : <u>299-E27-78</u>
N-Coord : <u>42,861</u>	W-Coord : <u>48,231</u>	TOC Elevation : <u>645.00</u>
Water Level, ft :	Date Drilled : <u>6/30/1974</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

This borehole was drilled in June 1974 to a depth of 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. No information concerning grouting or perforations was found; therefore, it is assumed that the borehole was not grouted or perforated. The top of the casing, which is the zero reference for the SGLS, is even with the ground surface.

Equipment Information

Logging System : <u>1B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>02/1997</u>	Calibration Reference :	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>04/08/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>24.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>04/09/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>98.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>23.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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Analysis Information

Analyst : D.L. Parker

Data Processing Reference : P-GJPO-1787

Analysis Date : 05/06/1997

Analysis Notes :

This borehole was logged by the SGLS in two log runs. All pre- and post-survey field verification spectra, except one, met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The post-survey field from the last logging run failed due to a faulty high voltage power supply. The energy calibration and peak-shape calibration from the spectra that best matched the data were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. There was some gain drift and it was necessary to adjust the established channel-to-energy parameters during processing of log data to maintain proper peak identification.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides detected in this borehole were Cs-137, Co-60, Eu-152, and Eu-154. The presence of Cs-137 was measured continuously from the ground surface to 41.5 ft, continuously from 44.5 to 61.5 ft, and intermittently from 62.5 to the bottom of the borehole. Co-60 contamination was detected continuously from 78 ft to the bottom of the logged interval. Eu-152 and Eu-154 contamination was detected only at the ground surface.

The K-40 concentration values gradually increase from 41 to 51.5 ft, decrease from 70.5 to 75 ft, and then gradually increase from 75.5 to the bottom of the logged interval (98.5 ft). A definitive peak occurs on the U-238 plot at a depth of 42 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank C-103.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A comparison plot is also provided showing the Cs-137 and Co-60 concentrations determined from the SGLS and those determined from the Radionuclide Logging System (RLS) in 1994.

A plot of representative historical gross gamma-ray logs from 1975 to 1994 is included. The headings of the



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plots identify the date on which the data in the plots were gathered.